
U.S. Department of the Interior • U.S. Geological Survey

MINERAL INDUSTRY SURVEYS

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TIN IN FEBRUARY 1997

Domestic consumption of primary tin in February was estimated by the U.S. Geological Survey (USGS) to be about 3% lower than in January 1997 and 31% higher than in February 1996.

The *Platt's Metals* Week composite price for tin was \$3.96 per pound; slightly lower than in January and 5% lower than in February 1996.

In Washington, D.C., the Steel Packaging Council of the American Iron and Steel Institute announced that it had enlisted two new partners in its sustained program to boost consumer awareness of canned foods. The two new partners are the Can Manufacturer's Institute and The Canned Food Information Council. The Steel Packaging Council reported that they were about one-half way through a 5-year, \$12-million advertising and public relations campaign designed to improve the image of canned food. Tinplate is the material predominantly used for metal food containers.¹

In the United Kingdom, ITRI, formerly the International Tin Research Institute, announced that it has set as its goal an increase in worldwide tin demand by 20,000 to 30,000 metric tons per year within 3 years. The two main areas where ITRI expects to accomplish this goal are in lead-free solders for the plumbing and electronics industries, and in inorganic tin compounds as a replacement for antimony in flame-retardant chemicals. The lead-free solders could mean an extra 15,000 to 20,000 tons of consumption yearly, and the introduction of a 97% tin-3% copper plumber's solder could add another 3,000 tons. The use of tin in fire retardants for polymeric materials could represent 11,000 to 14,000 tons of additional yearly tin use, according to ITRI.²

In Japan, it was reported that the development of lead-free solders for use in the automotive and consumer electronics sectors was gaining pace. Although no regulations restricting the use of lead in these applications have been introduced in Japan, there was some concern in Japan that tariffs or import

bans could be placed in Europe or the United States on products containing lead. Solders usually consists of tin-lead alloys, with other metals added to impart specific properties. Eliminating lead from solder raises the melting point and reduces the wettability and the mechanical strength of the alloys, which can be detrimental in automotive applications, where safety is paramount. Taiho Kogyo Co. Ltd. is a leading Japanese producer of automotive bearing alloys and is affiliated with the Toyota Group. In a joint venture with Toyota's central research institute, the firm has developed a tin-silver-bismuth alloy for use as a solder in automotive applications. Silver raises the mechanical strength of the solder and lowers its melting point. Bismuth additions are restricted to 3% or less, since larger additions harden the alloy and make it more difficult to process solder in thread form. Reportedly, the new solder is suitable for use in automotive applications since it can withstand repeated heating and mechanical vibration. Taiho Kogyo now produces the solder in rod and thread form and is developing it in paste form. Senju Metal Industry Co. Ltd. is the largest Japanese producer of solders. In a joint venture with Matsushita Electric Industrial Co. Ltd., Senju has developed a tin-zinc-silver-bismuth solder alloy in paste form, for use in the assembly of consumer electronic equipment, such as televisions and VCR's.³

In Russia, it was reported that about \$5 million has been invested in the Novosibirsk tin smelter to expand its solder and alloy production, boosting annual capacity to 3,000 tons, a 20% increase over that of 1995. Novosibirsk continued to operate at about 65% of its annual capacity of 20,000 tons of refined tin. The average grade of tin concentrate being treated was 52%. About 40% of its tin concentrate feedstock was imported from Portugal, the United Kingdom, Peru, China, and Nigeria. Tin mines in Russia like Solnechniy Gok, Khrustalny Gok, Hingan Gok, and Deputatsky Gok provided the smelter with the remaining 60% of its tin concentrate feedstock.⁴

In Peru, Minsur, the country's only tin producer, announced

it would increase tin output in 1997 by 23%. Minsur produced 27,000 tons of tin-in-concentrate in 1996 (up 21% over the prior year), after processing 497,000 tons of ore. Minsur planned to boost daily treatment capacity at its underground San Rafael tin mine by yearend 1997, from 15,000 tons to 25,000 tons. The San Rafael Mine, in the southern Andean region of Puno, has tin ore reserves of 12 million tons with tin grades of 5.2% to 6.5%, making it one of the world's richest deposits. Minsur began operating its new \$30 million Funsur tin refinery in mid-1996, with an initial production capacity of 15,000 tons yearly of 99.5% tin and treatment capacity of 30,000 tons of tin concentrate. A second stage expansion scheduled for 1999 would lift metal production capacity to 20,000 tons yearly and concentrate treatment capacity to 40,000 tons yearly, as well as raising tin purity to 99.99% with the installation of an oxygen plant. Minsur observed that it was also developing a \$5-million,

80-kilometer transmission line to tap into energy generated by the Machu Picchu hydroelectric power plant. Minsur estimated the project could save it \$2 million yearly in energy costs.⁵

Update

On April 11, 1997, the *Platt's Metals Week* composite price for tin was \$3.83 per pound.

¹American Metal Market. Canned Food Campaign Focuses on Awareness. V. 105, No. 32, Feb. 14, 1997, p. 1.

²_____. Around the Metal Market. V. 105, No. 37, Feb. 24, 1997, p. 16.

³Roskill's Letter from Japan. Tin: Development of Lead-Free Solders in Japan. No. 250, Feb. 1997, p. 7.

⁴Metal Bulletin. Russia's Novosibirsk Expands Solder and Alloy Business. No. 8152, Feb. 10, 1997, p. 7.

⁵Platt's Metals Week. Minsur Aims to Post 24% Tin Output Increase. V. 68, No. 6, Feb. 10, 1997, p. 10.

TABLE 1
SALIENT TIN STATISTICS 1/

(Metric tons, unless otherwise noted)

	1996 p/	1997		
		January	February	January-February
Production, secondary e/ 2/	10,800	900	900	1,800
Consumption:				
Primary	36,200	4,130 r/	4,000	8,130
Secondary	10,300	823 r/	844	1,670
Imports for consumption, metal	33,200	3,450	NA	NA
Exports, metal	2,790	411	NA	NA
Stocks at end of period	4,670	5,100 r/	5,320	XX
Prices (average cents per pound): 3/				
Metals Week composite 4/	412.43	396.17	395.64	XX
Metals Week New York dealer	288.10	274.22	274.50	XX
London, standard grade, cash	279.00	266.00	266.00	XX
Kuala Lumpur	275.19	264.09	263.54	XX

e/ Estimated. p/ Preliminary. r/ Revised. NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits, except prices.

2/ Comprises tin recovered from alloys and tinplate. The detinning of tinplate (coated steel) yields only a small part of the total.

3/ From Platt's Metals Week.

4/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed charges, finance charges, and a risk factor. It normally is substantially higher than other tin prices.

TABLE 2
METALS WEEK COMPOSITE PRICE 1/

(Cents per pound)

Period	High	Low	Average
1996 (annual)	436.25	388.49	412.43
1996:			
February	417.70	411.89	415.55
March	427.03	405.03	414.71
April	435.05	422.96	429.61
May	436.25	415.30	426.88
June	418.01	410.83	413.65
July	423.04	408.27	417.03
August	411.84	407.75	409.11
September	413.10	402.69	408.04
October	404.38	396.12	400.25
November	409.57	392.40	401.00
December	405.37	388.49	394.76
1997:			
January	404.19	387.89	396.17
February	403.46	390.40	395.64

1/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed charges, finance charges, and a risk factor. It normally is substantially higher than other tin prices.

Source: Platt's Metals Week.

TABLE 3
TINPLATE PRODUCTION AND SHIPMENTS IN THE UNITED STATES 1/

(Metric tons, unless otherwise noted)

Period	Tinplate waste (waste, strips, cobble, etc.) (gross weight)	Tinplate (all forms)			Shipments 2/
		Gross weight	Tin content	Tin per metric ton of plate (kilograms)	
1996 p/	181,000	1,550,000	9,620	6.2	2,750,000
1997:					
January	15,900 r/	139,000 r/	827 r/	6.0 r/	204,000
February	13,600	138,000	775	5.6	NA

p/ Preliminary. r/ Revised. NA Not available.

1/ Data are rounded to three significant digits.

2/ Shipments data from American Iron and Steel Institute monthly publication AIS10.

TABLE 4
U.S. TIN IMPORTS FOR CONSUMPTION AND EXPORTS 1/

(Metric tons)

Country or product	1996 p/	1996	1997
		December	January
Imports:			
Metal (unwrought tin):			
Bolivia	6,290	515	80
Brazil	9,460	1,200	740
Chile	407	--	261
China	2,760	203	356
India	898	80	240
Indonesia	7,550	666	604
Malaysia	965	--	400
Peru	481	--	679
Russia	435	--	--
Other	922 r/	506	93
Total	30,200	3,170	3,450
Other (gross weight):			
Alloys	11,800	1,360	891
Bars and rods	695	56	70
Foil, tubes, and pipes	(2/)	--	--
Plates, sheets, and strip	641	4	18
Waste and scrap	6,740	258	453
Miscellaneous	1,360	129	96
Total	21,300	1,800	1,530
Exports (metal)	4,780	489	411

p/ Preliminary. r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5
CONSUMPTION OF TIN IN THE UNITED STATES, BY FINISHED PRODUCT 1/

(Metric tons of contained tin)

		1997						January-
Product	1996 p/	January			February			February
		Primary	Secondary	Total	Primary	Secondary	Total	total
Alloys (miscellaneous) 2/	96	39 r/	(3/)	39 r/	32	--	32	71
Babbitt	245	19 r/	W	19 r/	21	W	21	39
Bar tin and anodes	78	W	--	W	W	--	W	W
Bronze and brass	1,860	45	99	144	61	101	162	305
Chemicals	1,270	1,430 r/	--	1,430 r/	1,430	--	1,430	2,870
Collapsible tubes and foil	25	21	W	21	22	W	22	43
Solder	8,720	635	W	635	539	228	767	1,610
Tinning	1,650	132 r/	--	132 r/	135	--	135	268
Tinplate 4/	9,620	827 r/	W	827 r/	775	W	775	1,600
Tin powder	291	49	--	49	48	--	48	97
White metal 5/	8	W	--	W	W	--	W	W
Other	5,870	30	224 r/	254 r/	36	15	51	100
Total reported	29,700	3,230 r/	323 r/	3,550 r/	3,100	344	3,450	7,000
Estimated undistributed consumption 6/	16,800	900	500	1,400	900	500	1,400	2,800
Total	46,500	4,130 r/	823 r/	4,950 r/	4,000	844	4,850	9,800

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includesterne metal.

3/ Revised to zero.

4/ Includes secondary pig tin and tin acquired in chemicals.

5/ Includes pewter, britannia metal, and jewelers' metal.

6/ Estimated consumption of plants reporting on an annual basis.

TABLE 6
DEFENSE LOGISTICS AGENCY
TIN STOCKPILE DISPOSALS 1/

(Metric tons)

Period	Monthly disposals 2/
1996:	
February	450
March	534
April	5
May	10
June	330
July	1,180
August	1,370
September	2,300
October	--
November	210
December	200
Year total	6,670
1997:	
January	215
February	200
Total	415

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ These disposals represent only the daily, spot sales program. They do not include the long-term dealer contract sales program.

Source: Defense Logistics Agency.